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North Carolina Department of Transportation
Statewide Planning Branch

Transportation Plan Technical Report for the City of Southport

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March 2001

Transportation Plan Technical Report
For The
City of Southport, North Carolina

Prepared by the:

Statewide Planning Branch
Planning and Environment
North Carolina Department of Transportation

In cooperation with:

The City of Southport
The Federal Highway Administration
U. S. Department of Transportation

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Executive Summary

Overview

Officials of the City of Southport, prompted by a desire to adequately plan for the future transportation needs, requested the North Carolina Department of Transportation's (NCDOT) assistance in developing a citywide thoroughfare plan.

Thoroughfare Planning

The objective of thoroughfare planning is to enable the transportation network to be progressively developed to adequately meet the transportation needs of a community as land develops and traffic volumes increase. By planning now for our future transportation needs, unnecessary costs to the physical, social and economic environment can be avoided or minimized. Thoroughfare planning is a tool that can be used by local officials to plan for future transportation needs, while at the same time reducing the costs to our environment.

The primary purpose of this report is to present the findings and recommendations of the thoroughfare plan study conducted for the City of Southport. The secondary purposes of this report are to document the basic thoroughfare planning principles and procedures used in developing these recommendations and to provide the City of Southport with information on the best strategies for implementing the recommendations in this report. This report is divided into three parts. The first part of the report provides information on the principles of thoroughfare planning. The next part provides a detailed description of the Thoroughfare Plan study recommendations as well as the development of these recommendations. Finally, the last part of the report addresses different methods by which the recommendations contained within can be implemented.

Further information that will be useful to area planners is provided in the Appendices.

Thoroughfare Plan Street Tabulation
Level of Service Definitions
Public Involvement Aspect
Purpose and Need of Recommended Improvements

Highlights of the Thoroughfare Plan

Major highlights of the Southport Thoroughfare Plan and its recommendations are outlined below. The Thoroughfare Plan Map is shown in **Figure 1**.

- **NC 211 from Beach Road to Fodale Avenue**
  Widen Roadway to a 4-lane median divided facility.

- **Northern Connector**
  Construct a 2-lane facility on new location from Leonard Street to NC 87.

- **Yaupon Drive**
  Construct a 2-lane facility on new location utilizing existing donated right-of-way.

- **NC 211 (Howe Street)**
  Widen existing roadway to four lanes.

- **NC 87/NC 133**
  Widen existing roadway to a 5-lane divided facility.

- **Dosher Cut-Off Road**
  Continue to support TIP project R-3324 providing a new connector from NC 87/NC 133 directly to Beach Road.

Implementation

The North Carolina Department of Transportation (NCDOT) and the City of Southport are jointly responsible for the proposed thoroughfare improvements. Cooperation between the State and the City is of primary concern if the recommendations outlined above are to be successfully implemented. The plan has been mutually adopted by both parties, and it is the responsibility of the City to implement the plan following the guidelines set forth in this report.

It is important to note that the mutually adopted plan is based on anticipated growth within and around the City of Southport as indicated by past trends and the anticipated development of the area. Prior to the construction of each project, a more detailed study will be required to revisit development trends and to determine the specific location and design requirements for each study.

I. Transportation Planning Principles

Basic Principles

The urban street system typically occupies 25 to 30 percent of the total developed land in the urban area. Since the system is permanent and expensive to build and maintain, much care and foresight are needed in its development. Thoroughfare planning is the process used by public officials to insure the development of the most logical and appropriate street system to meet future travel desires.

Purpose of Planning

There are many benefits to be gained from thoroughfare planning, but the primary objective is to insure that the street system will be progressively developed in such a manner as to adequately serve future travel desires. Thus, the cardinal concept of thoroughfare planning is that provisions be made for street and highway improvements so that as needs arise, feasible opportunities to make improvements exist.

Some of the benefits derived from thoroughfare planning are:

1. Each street can be designed to perform a specific function. This permits savings in right-of-way and construction costs; and encourages stability in travel and land use patterns.

2. Local officials and citizens are informed as to future improvements. Public facilities can be better located; and damage to property and appearance can be minimized (for example: buildings and plants can be located to permit future street widening).

3. Residents will know which streets will be developed as major thoroughfares and be able to make an informed decision when choosing a home.

4. City officials will know when improvements will be needed and can schedule funds accordingly.

Objectives of Thoroughfare Planning

The primary aim of a thoroughfare plan is to guide the development of the urban street system in a manner consistent with the changing land use and resulting traffic patterns. A thoroughfare plan will enable street improvements to be made as traffic demands increase, and it helps eliminate unnecessary improvements, so needless expense can be averted. By developing the urban street system to keep pace with increasing traffic demands, a maximum utilization of the system can be attained, requiring a minimum amount of land for street purposes. In addition to providing for traffic needs the thoroughfare plan should embody those details of good urban planning necessary to present a pleasing and efficient urban community. The location of present and future population, commercial, and industrial development affects major street and highway locations. Conversely, the location of major streets and highways within the urban area will influence the urban development pattern.

Other objectives of a thoroughfare plan include:

- Providing for the orderly development of an adequate major street system as land development occurs,
- Reducing travel and transportation costs,
- Reducing the cost of major street improvements to the public through the coordination of the street system with private action,
- Enabling private interests to plan their actions, improvements, and development with full knowledge of public intent,
- Minimizing disruption and displacement of people and businesses through long range advance planning for major street improvements,
- Reducing environmental impacts, such as air pollution, resulting from transportation, and
- Increasing travel safety.

Operational Efficiency

The operational efficiency of a street is improved by increasing the capability of the street to carry vehicular traffic and people. In terms of vehicular traffic, the capacity of a street is the maximum number of vehicles that can pass a given point on a roadway during a given period under prevailing roadway and traffic conditions. The physical features of the roadway, nature of traffic, and weather affect capacity.

Physical ways to improve vehicular capacity include:

New highways - the construction of new highways on new location is an effective method for relieving traffic congestion on the existing transportation system.

System improvements - congestion is often caused by an inefficient street system. Developing a more efficient system of streets that will better serve travel desires can alter travel demand on a facility. A more efficient system can reduce travel distances, time and cost. Improvements in system efficiency can be achieved through the concept of functional classification of streets and development of a coordinated major street system.

Geometric design - improving the geometric design of roadways can significantly improve operations and traffic flow, resulting in reduced congestion. Design improvements are based on specified design criteria, traffic volumes, speed, and sight distance. Geometric design improvements can include improvements to the horizontal/vertical alignment, greater clearance, adding to the number and width of lanes, widening shoulders, deleting or improving median crossovers, improving traffic control devices and improved intersection design. Geometric improvements typically provide high benefit/cost ratios.

Reconstruction - roadway capacity can be increased by reconstructive efforts that improve the roadways geometric and structural standards, improve the quality of operation and safety, and by improvements that extend the life-span of the facility.

Roadway widening - capacity can be increased through the addition of new lanes, or the widening of existing lanes. Drivers perceive wider lanes to be safer and will therefore travel at higher speeds reducing slow downs and bottlenecks. The addition of new lanes greatly increases the vehicle-carrying capacity of the facility.

Eliminating roadside obstacles - reduces side friction and improves a driver's field of sight.

Operational ways to improve street capacity include:

Control of access - a roadway with complete access control can often carry three times the traffic handled by a non-controlled access street with identical lane width and number of lanes.

Parking removal - increases capacity by providing additional street width for traffic flow and reduces friction to flow caused by parking and unparking vehicles.

One-way operation - the capacity of a street can sometimes be increased 20-50%, depending upon turning movements and street width, by initiating one-way traffic operations. One-way streets also can improve traffic flow by decreasing potential traffic conflicts and simplifying traffic signal coordination.

Reversible lanes - may be used to increase street capacity in situations where heavy directional flows occur at peak periods.

Signal phasing and coordination - uncoordinated signals and poor signal phasing restrict traffic flow by creating excessive stop-and-go operation.

Turn prohibitions - reduce turn conflicts, congestion, and accidents by eliminating certain intersection turn movements, primarily during peak hours.

Improved traffic information devices - upgrading traffic control devices provides better information to the driver and can be beneficial in reducing traffic congestion by reducing driver confusion and uncertainty.

Altering travel demand is a third way to improve the efficiency of existing streets. Travel demand can be reduced or altered in the following ways:

Carpools - encourage people to form carpools and vanpools for journeys to work and other trip purposes; this reduces the number of vehicles on the roadways and raises the people carrying capability of the street system.

Alternate mode - encourage the use of alternate modes of travel such as transit, bicycles, or walking for short distance trips.

Work hours - encourage industries, business, and institutions to stagger work hours or establish variable work for employees; this will reduce travel demand in peak periods and spread peak travel over a longer period.

Growth management - public policy can be used to regulate the location, pattern, density, and rate of growth of development. Growth regulations are tied to the capacity of the existing system. The growth management strategy controls congestion by restricting development unless a means to mitigate congestion impacts is proposed and implemented. New developments with the potential to cause congestion to increase beyond predetermined thresholds for a facility can be required to implement strategies to prevent such increases in congestion.

An example of a growth management policy would be: "A traffic impact analysis would be required for any project that generates more than 500 vehicle trips per day. Where it is projected that additional traffic from a project will exceed a volume/capacity ratio of 0.8 on the adjacent streets, increase the peak hour volume by 10% or more, or reduce the level of service to "D" or below, the project shall not be approved unless and until provision has been made for the improvement of said condition."

Thoroughfare System Classification

Streets perform two primary functions – traffic service and land service, which when combined, are basically incompatible. The conflict is not serious if both traffic and land service demands are low. However, when traffic volumes are high, conflicts created by uncontrolled and intensely used abutting property leads to intolerable traffic flow friction and congestion.

The underlying concept of the thoroughfare plan is that it provides a functional system of streets, which permits travel from origins to destinations with directness, ease, and safety. Different streets in the system are designed and called on to perform specific functions, thus minimizing the traffic and land service conflict. Streets are categorized as to function as local access streets, minor thoroughfares, or major thoroughfares.

Local Access Streets provide access to abutting property. They are not intended to carry heavy volumes of traffic and should be located such that only traffic with origins and destinations on the streets would be served. Local streets may be further classified as either residential, commercial, and/or industrial depending upon the type of land use which they serve.

Minor Thoroughfares are more important streets on the city system. They collect traffic from local access streets and carry it to the major thoroughfares. They may in some instances supplement the major thoroughfare system by facilitating minor through traffic movements. A third function that may be performed is that of providing access to abutting property. They should be designed to serve limited areas so that their development as major thoroughfares will be prevented.

Major Thoroughfares are the primary traffic arteries of the city. Their function is to move intra-city and inter-city traffic. The streets that comprise the major thoroughfare system may also serve abutting property, however, their principle function is to carry traffic. Therefore, direct property access should not be permitted on major thoroughfares. They should not be bordered by uncontrolled strip development because such development significantly lowers the capacity

of the thoroughfare to carry traffic and each driveway is a danger and an impediment to traffic flow. Major thoroughfares may range from a two-lane street carrying minor traffic volumes to major expressways with four or more traffic lanes. Parking normally should not be permitted on major thoroughfares.

Idealized Major Thoroughfare System

A coordinated system of major thoroughfares forms the basic framework of the urban street system, thus improving system efficiency through layout. A major thoroughfare system that is most adaptable to desire lines of travel within an urban area is the radial-loop system. It permits movement between various areas of the city with maximum directness.

This system consists of several functional elements – radial streets, crosstown streets, loop system streets, and bypasses.

Radial Streets provide for traffic movement between points located on the outskirts of the city and the central area. This is a major traffic movement in most cities, and the economic strength of the central business district depends upon the adequacy of this type of thoroughfare.

If all radial streets crossed in the central area, an intolerable congestion problem would result. To avoid this problem, it is very important to have a system of **Crosstown Streets** that form a loop around the central business district. This system allows traffic moving from origins on one side of the cental area to destinations on the other side to follow the area's border. It also allows central area traffic to circle and then enter the area near a given destination. The effect of a good crosstown system is to free the cental area of crosstown traffic thus permitting the central area to function more adequately in its role as a business or pedestrian shopping area.

Loop System streets move traffic between suburban areas of the city. Although a loop may completely encircle the city, a typical trip may be from an origin near a radial thoroughfare to a destination near another radial thoroughfare. Loop streets do not necessarily carry heavy volumes of traffic, but they function to help relieve central areas. There may be one or more loops, depending on the size of the urban area. They are generally spaced one-half mile to one mile apart, depending on the intensity of land use.

A **Bypass** is designed to carry traffic through or around the urban area, thus providing relief to the city street system by removing traffic that has no desire to be in the city. Bypasses are usually designed to through-highway standards, with control of access. Occasionally, a bypass with low traffic volume can be designed to function as a portion of an urban loop. The general effect of bypasses is to expedite the movement of through traffic and to improve traffic conditions within the city. By freeing the local streets for use by shopping and home-to-work traffic, bypasses tend to increase the economic vitality of the local area.

Application of Thoroughfare Planning Principles

The concepts presented in the discussion of operational efficiency, functional classification, and idealized major thoroughfare system are the conceptual tools available to the transportation planner in developing a thoroughfare plan. In actual practice, a thoroughfare plan is developed for established urban areas and is constrained by the existing land use and street patterns, existing public attitudes and goals, and current expectations of future land use. Compromises

must be made because of these constraints and the many other factors that affect major street locations.

Throughout the thoroughfare planning process it is necessary from a practical viewpoint that certain basic principles be followed as closely as possible. These principles are as follows:

1. The plan should be derived from a thorough knowledge of today's travel - its component parts, as well as the factors that contribute to it, limit it, and modify it.

2. Traffic demands must be sufficient to warrant the designation and development of each major street. The transportation plan should be designed to accommodate a large portion of all major traffic movements on a relatively few streets.

3. The plan should conform to and provide for the land development plan of the area.

4. Certain considerations must be given to urban development beyond the current planning period. Particularly in outlying or sparsely developed areas that have development potential, it is necessary to designate thoroughfares on a long-range planning basis to protect rights of way for future thoroughfare development.

5. While being consistent with the above principles and realistic in terms of travel trends, the plan must be economically feasible.

II. Development of Thoroughfare Plan

The objective of thoroughfare planning is to develop a transportation system that will meet future travel demand and enable people and goods to travel safely and economically. To determine the needs of an area, it is important to understand trends related to population, economy/employment, land use as well as those items relating to the existing transportation system and it's operational deficiencies.

Population

The traffic volume on any roadway is closely related to the size and distribution of the population served. By looking at past trends, a good indication of future growth can be determined.

Brunswick County continues to be one of the fastest growing counties in North Carolina. From 1990 to 1999, Brunswick County experienced a growth rate of 36.5%, ranking it 4th in North Carolina behind only Wake, Johnston and Union Counties. **Table 1** below shows population trends and projections for Brunswick County, Smithville Township and the City of Southport.

The 2020 projected population shows a slow but steady increase for the City of Southport. This projection is based in part on the popularity of the Brunswick County area as a population destination, the availability of suitable land in the Southport area and the past trends concerning growth in the area.

Table 1: Population Trends and Projections

	1970	1975	1980	1985	1990	1995	2000	2010	2020
Brunswick County	24,223	33,900	35,777	44,840	50,985	60,591	70,813	87,371	102,626
Smithville Township	4346	-------	6838	-------	9488	10,735	12,145	15,545	19,898
Southport	-------	-------	2824	-------	2369	2540	2854	3653	4676

- Brunswick County figures from the Office of State Planning
- Smithville Township and Southport figures from the Office of State Planning (up to 1990)
- Smithville Township projections based on growth from 1980 to 1990
- Southport projections based on percentage of township population

Economy and Employment

An important factor in estimating the future traffic growth of an area is its economic base. This base determines the employment type and size, as well as commuter traffic patterns around the area. **Table 2** below shows the percentage of employed persons by industry in the City of Southport.

Table 2: City of Southport Employed Persons by Industry

Occupation	% Employed 1980	% Employed 1990
Agriculture, forestry, mining	0%	0%
Construction	8%	1%
Nondurable goods manufacturing	6%	2%
Durable goods manufacturing	0%	4%
Transportation	2%	1%
Communication, other public utilities	13%	15%
Wholesale trade	2%	2%
Retail trade	16%	17%
Finance, insurance, and real estate	5%	8%
Business and repair services	3%	4%

Personal, entertainment and recreational services	7%	8%
Health services	8%	11%
Educational services	10%	9%
Other professional and related services	4%	5%
Public Administration	12%	11%
Fishing	5%	2%

Source: 1990 Southport Land Use Plan and 1990 U.S. Census

The table below shows the largest industrial employers in the Southport area.

Table 3: Southport Area Major Industrial Employers, 1995

Industry	Product	Employees
Archer Daniel Midland Co.	Organic citric chemicals	200
Carolina Power and Light	Electrical Provider	894
Caroon, CB Crab Co. Inc.	Crab meats/products	30
Cogentrix, Inc.	Cogeneration facility	18
State Port Pilot	Newspaper publishing	15
Tri-Tech, Inc.	Police/law enforcement supplies	50
Total		1207

Source: 1995 NC Manufacturers Directory

No significant change to Southport's employment is expected within the planning period. Suitable land for industrial and commercial development does exist, but this development is projected to be slow and follow the existing development pattern very closely.

Land Use

Single-family residential housing generally dominates and use in Southport. This includes two new subdivisions in the area of NC211/Ferry Road; the Landing and Harbor Oaks. Minor changes have occurred in the past 10 years, but major commercial areas continue to be in the central business district, marine related commercial uses in the State Ports Authority small boat harbor area, strip commercialization along Howe Street, and development around the intersection of NC 87 and NC 211.

The following land use summary provides an analysis of uses by land use category and a comparison of 1985, 1990 and 1997 land use acreage.

Table 4: Existing Land Use Within Total Planning Jurisdiction

Land Use	1997 Acres	1990 Acres	1985 Acres
Single-family	645.8	529.0	463.5
Multi-family	39.2	31.7	15.0
Mobile Home	20.9	24.7	18.1
TOTAL RESIDENTIAL	705.9	585.4	496.6
Commercial	122.7	111.3	101.2
Industrial	124.8	124.8	3.6
Institutional	85.0	83.2	85.2
Parks and Open Space	25.1	17.0	17.0
Tans/Comm/Util	595.3	560.8	518.1
Undeveloped	1981.3	2157.5	2418.3
TOTAL ACREAGE	3640.1	3640.0	3640.0

Sources: 1985 figures – Southport Land Use Plan Update, 1985; 1990 figures – Southport Land Use Plan Update, 1990; 1997 figures – Windshield survey by Holland Consulting Planners, Inc.

The City of Southport is not likely to experience drastic changes in land use within the planning horizon. Development will be gradual, as vacant land is used for primarily residential housing and to a lesser extent, commercial use. The projected land uses will more than likely develop as follows:

Commercial development will continue along the Howe street corridor, around the intersection of NC 211 and NC 87 and along NC 211 between "Beach Road" and NC 87.

No significant industrial development is expected within the corporate limits. Industrial development would be encouraged outside the corporate limits generally North of Jabbertown Road, East of NC 87 and North of the city limit line to the East of Leonard Street.

Residential housing is expected to develop primarily to the west/northwest of the Central Business District in the area near and around the Smithville Woods subdivision, and in the vicinity of NC 211/Ferry Road near and around the subdivisions in that area (The Landing and Harbor Oaks).

Travel Demand

The City of Southport is served primarily by NC 211 and NC 87, which feed into the area just north of the Southport City limits. NC 211 (Howe Street) then serves as a "main street" through town to it's intersection with Moore Street. Moore Street then becomes NC 211 that ends at the North Carolina Ferry terminal. A list of the city's major roads can be seen below and a map of the road system within the planning area can be seen in **Figure 2**.

Major thoroughfares include NC 87, NC 211, NC 133, and the Dosher Cut-off Road.

Minor thoroughfares include West Street, Fodale Avenue, Leonard Street and Jabbertown Road.

Travel demand is satisfied by the individual characteristics of each facility (i.e. number of lanes, lane width, etc.). The North Carolina Department of Transportation classifies the extent of travel demand by annually reporting Average Annual Daily Traffic (AADT) counts for road sections in North Carolina. **Figure 3** shows the AADT volumes on facilities in the Southport Planning Area for 1997 and projected AADT volumes for 2025.

Past trends, land use, as well as certain other factors influence future growth in traffic volumes. Traffic has increased and is expected to increase on the major facilities in the planning area. These include NC 211 – Howe Street through town, NC 87 and NC 133, NC 211 to Long Beach Road, Dosher Cut-Off Road, and Moore Street/Ferry Road. **Figure 3** shows the projected AADT volumes on facilities in the Southport Planning Area for 2025.

Capacity Analysis

Capacity represents the maximum amount of traffic that can be accommodated by a given facility under existing roadway and traffic conditions. The traffic volume relationship to the roadway capacity will determine the level of service being provided. The traffic engineering community has identified six levels of service that describe the range of possible conditions. These six levels of service are illustrated and defined in **Appendix A3**.

Figure 4 shows the anticipated 2000 capacity deficiencies on facilities in the Southport Planning Area.

Capacity deficiencies exist primarily in two locations at the end of the planning horizon, in the year 2025. Traffic congestion is expected to worsen along NC 211 from Beach Road into Southport and through town to Leonard Street. It is also expected to worsen on NC 87/NC133 coming south, utilizing the Dosher Cut-Off Road and heading towards Oak Island. The 2025 capacity deficiencies can be seen in **Figure 5**.

In meetings with town officials and Southport citizens, some areas/roads were denoted as problems. This information was included in the evaluation for determination of the recommended thoroughfare plan.

Noted concerns/problem areas include:

- NC 211 from 12th Street to Beach Road
  This facility serves as the "gateway" to Southport being the main entrance and really only one of two ways to get to the area. This is a partially tree lined roadway that is currently a two lane facility.

- NC 87/NC 133 from planning area boundary to NC 211
  These facilities serve as an entrance to the Southport area bringing traffic south from I-40 and the Wilmington area.

- Dosher Cut-Off Road
  This facility serves as a "short cut" for traffic coming down NC 87/NC 133 with a final destination in the vicinity of Oak Island. While it does not directly affect traffic in the Southport corporate limits, it does affect traffic coming into the Southport area and traffic exiting the Southport area headed to Oak Island.

- NC 211 through Central Business District (Howe Street)

- NC Ferry Operation Traffic
  This also includes industrial traffic from the same side of town.

- Direct connection from Southport to Oak Island that would serve as an alternative to NC 211 – NC 133

III. Thoroughfare Plan

A thoroughfare plan identifies existing and anticipated future deficiencies in the transportation system and uncovers the need for new facilities. The thoroughfare plan also provides a representation of the existing highway system by functional use, which includes major thoroughfares, minor thoroughfares, and the local street system.

This chapter presents the thoroughfare plan recommendations. This thoroughfare plan was developed by evaluating past and current data, future trends, and input from City of Southport staff and citizens. It is the goal of this study to recommend a plan for the transportation system that will serve the anticipated traffic and land development needs of the City of Southport over the next 25 years. The primary objective of this plan is to reduce traffic congestion and improve safety by eliminating both existing and anticipated deficiencies in the thoroughfare system. These recommendations are shown in **Figure 6**.

Major Thoroughfares

NC 211 from Beach Road to Fodale Avenue

It is recommended that this existing roadway be widened to a 4-lane divided facility. Traffic volumes along this road are anticipated to increase gradually as population increases, land develops and the Southport/Oak Island area continues to be an attractive tourist destination. This route serves as a "gateway" to Southport, however it's existing 2-lane cross section is already becoming congested. The drive into Southport on this facility is a picturesque journey, with one passing large oak trees on both sides of the roadway. Right of way is limited and the importance of these trees cannot be taken too lightly, however as Southport grows and develops, this main (and really only) entrance into town will require a major redesign. Right of way is available for an intermediate widening to a 3-lane section. This however would only temporarily help ease congestion and only in one direction (3 lanes of through traffic here would provide greater capacity then a cross section with 2 lanes of through traffic and a center turn lane). Southport cannot hope to continue attracting residents, business and tourist traffic without providing a safe and reliable (non congested) facility into town. This precipitates the need for a 4-lane divided facility. This type of cross section could be designed in such a way as to minimize impacts on the existing tree canopy (at least one side) and to maximize the picturesque quality one feels when entering the Southport area now. This 4-lane divided facility is also a continuation of recommendations from the Oak Island Thoroughfare Plan adopted in 1998. That plan recommended widening NC 211 to a 4-lane divided facility from the proposed location of the second Oak Island Bridge to the CP&L canal just southeast of the Dosher Cut-off Road (the edge of the study planning boundary).

NC 211 (Howe Street)

It is recommended that this existing roadway be widened to a 4-lane facility. This road currently exists as a 2-lane facility with intermittent parking on one or both sides. Turning vehicles in both directions worsens traffic congestion, as residential and commercial development exists along this stretch of road. This coupled with the numerous existing cross streets at close intervals makes matters that much worse. However, the general problem with this facility is the traffic volume wishing to utilize this roadway. The entire stretch of roadway is a destination and traffic volumes are expected to increase throughout the planning period. Intermediate steps could be taken to improve this roadway including traffic signals (when warranted) to improve cross street movements, partial removal of parking to accommodate additional turn lanes, etc. It is envisioned that the ultimate cross section of this roadway could be built without the additional need of right of way in most places. This would however eliminate on-street parking and this

fact should be taken into consideration as this roadway develops and as parking policies are debated and designed.

NC 87/NC 133
It is recommended that this existing roadway be widened to a 5-lane divided facility. Currently much of this section of road exists as a 3-lane section. Projected traffic volumes imply the need for a 5-lane facility. This facility could be designed in much the same way as NC 211 as proposed above, with a landscaped median that provides a picturesque entry into the Southport area.

Dosher Cut-Off Road (TIP Project # R-3324)
This project exists as part of the NCDOT Transportation Improvement Program. Money has been set aside to fund this project with planning scheduled to begin in 2003. Construction is scheduled to begin tentatively in 2008. This facility would provide a more direct connection from NC 87/NC 133 to the Oak Island area. It would help to alleviate traffic congestion directly caused by traffic heading to Oak Island on portions of NC 87 and NC 211. It is recommended that Southport continue to endorse this project and keep working with local and state officials to keep the schedule on track.

Minor Thoroughfares

Northern Connector
It is recommended that a 2-lane facility be constructed on new location. This road will connect Leonard Street with NC 87 and provide an alternative to NC 211 for traffic heading towards Wilmington and Interstate 40. This facility, in conjunction with Yaupon Drive (see below) will help to alleviate traffic from being forced to utilize Howe Street through town or Jabbertown Road (a residential street). Currently, all NC ferry traffic as well as industrial traffic located on the southeastern side of town generally use NC 211 as the ingress/egress into and out of Southport. The Southport - Fort Fisher Ferry operates from a facility at the end of NC 211. It is also anticipated that the Bald Head Island Ferry operation will begin operations near this location in 2001. The Bald Head Island Ferry and the Southport - Fort Fisher Ferry each currently carry approximately 400,000 passengers per year. This traffic coupled with the industrial traffic from the ADM and Cogentrix plants will be able to bypass the already congested strip of Howe Street through Southport. Southport downtown business's voiced a concern about a loss of business due to this proposed bypass of the downtown district. These concerns could be eased with proper signage during the construction and operation of this new facility. A sign directing people to "Historic Downtown Southport" is in most cases a much more effective way of drawing tourist traffic. Those people truly wishing to bypass the congested part of downtown (local residents, through trips, etc.) would then be free to ease the traffic woes of those utilizing downtown as a destination. This route could also be utilized as an evacuation route for the southeastern side of Southport in the event of natural or man-made disasters.

Yaupon Drive
It is recommended that this existing right of way be constructed as a two lane facility. This road would connect Moore Street in the vicinity of the Ferry Road to Leonard Street. When used in conjunction with the Northern Connector, this provides a "bypass" of the downtown area, and an alternative evacuation route in times of disaster.

Other Minor Thoroughfares
No major improvements are required on the other minor thoroughfares in town: West Street, Fodale Avenue, Leonard Street and Jabbertown Road. However, these roadways should be

widened in narrow sections to 24 feet to meet secondary road standards and for capacity, safety and driver comfort reasons.

Local streets in town could also be widened when possible to 24 feet for the same reasons.

Alternate Modes

Transit

There is currently no transit service within the City of Southport or surrounding area. No service is expected within the planning period.

Bicycle and Pedestrian Transportation

Southport is a wonderful friendly place for bicyclist and walking enthusiasts. Southport has city designated bicycle routes as well as North Carolina designated bicycle routes. There is also a designated self-guided walking tour. Southport is committed to providing safe and enjoyable bicycle and pedestrian facilities. The specific routes as well as some future improvement information can be found below.

Bicycle Routes

The City of Southport maintains five and one-half miles of designated bicycle routes. These routes follow quiet neighborhood streets, connecting Southport's major attractions. These routes are signed with a green and white bike route sign. Facilities within these routes include: Bay Street, West Street, Atlantic Avenue, 9th Street, Indigo Plantation Drive, Fodale Drive, and Moore Street.

In North Carolina, the Office of Bicycle and Pedestrian Transportation within the North Carolina Department of Transportation has created a system of Bicycling Highways. Ten different routes which cover 3,000 miles of lightly-traveled country roads currently comprise the system. Two of these routes exist in Southport. The Cape Fear Run is a 160-mile route that roughly parallels the course of the Cape Fear River through the coastal plain to the sea. This route terminates in Southport utilizing the Southport-Fort Fisher Ferry connection. This route is designated as Bike Route 5.

The Ports of Call route consists of 300 miles of roadway that take you to all the major ports of the colonial era. This route enters Southport on NC 211, utilizes Howe Street and Moore Street and exits the Southport area on the Southport-Fort Fisher Ferry. This route is designated as Bike Route 3.

These routes can be seen in **Figure 8**.

Walking Trail/Tour

The City of Southport Historical Society maintains a self guided walking tour of much of the downtown area. This walking tour utilizes existing city facilities while giving the visitor a glimpse into the rich history of Southport. This tour begins at the Southport Visitor's Center and makes a circuitous route around the downtown area utilizing Moore Street, Bay Street, Atlantic Avenue among others.

Bicycle Projects

One current project exists in the NCDOT Transportation Improvement Program. Project E-4004 will add wide paved shoulders to NC 211 from Rhett Street to the NC Ferry Terminal. This project will be a benefit to bicyclists utilizing either Southport's Bicycle Route along NC 211 or those using the NC Bicycle Route along this road. This project is expected to be completed in 2001.

For any information about bicycle routes or projects in Southport, or to request/discuss future projects, please contact the Office of Bicycle and Pedestrian Transportation of the NCDOT.

IV. Implementation

Implementation is one of the most important aspects of the transportation plan. Unless implementation is an integral part of this process, the effort and expense associated with developing the plan is lost. There are several tools available for use by the Town of Southport to assist in the implementation of the thoroughfare plan. They are as follows:

State-Municipal Adoption of the Thoroughfare Plan

The Town of Southport and the North Carolina Department of Transportation have mutually approved the thoroughfare plan shown in **FIGURE 1**. This mutually approved plan serves as a guide for the Department of Transportation in the development of the road and highway system for Southport. The approval of the plan by the town enables standard road regulations and land use controls to be used effectively in the implementation of this plan.

Subdivision Controls

Subdivision regulations require every subdivider to submit to the Town Planning Commission a plan of any proposed subdivision. It also requires that subdivisions be constructed to certain standards. Through this process, it is possible to require the subdivision streets to conform to the thoroughfare plan and to reserve or protect (dedicate) necessary right-of-way for projected roads and highways that are to become a part of the thoroughfare plan. The construction of subdivision streets to adequate standards reduces maintenance costs and simplifies the transfer of streets to the State Highway System.

Land Use Controls

Land use regulations are an important tool in that they regulate future land development and minimize undesirable development along roads and highways. The land use regulatory system can improve highway safety by requiring sufficient setbacks to provide for adequate sight distances and by requiring off-street parking.

Development Reviews

Driveway access to a state-maintained street or highway is reviewed by the District Engineer's office and by the Traffic Engineering Branch of the North Carolina Department of Transportation. In addition, any development expected to generate large volumes of traffic such as shopping centers, fast food restaurants, or large industries may be comprehensively studied by staff from the Traffic Engineering Branch, and/or Roadway Design Unit of the NCDOT. If done at an early stage, it is often possible to significantly improve the development's accessibility while preserving the integrity of the thoroughfare plan.

Funding Sources

Transportation Improvement Program

North Carolina's Transportation Improvement Program (TIP) is a document which lists all major construction projects the Department plans for the next six years. Similar to local Capital Improvement Program projects, TIP projects are matched with projected funding sources.

Each year when the TIP is updated, completed projects are removed, programmed projects are advanced, and new projects are added.

During annual TIP public hearings, municipalities request projects to be included in the TIP. A Board of Transportation member reviews all of the project requests in a particular area of the state. Based on the technical feasibility, need, and available funding, the board member decides which projects will be included in the TIP. In addition to highway construction and widening, TIP funds are available for bridge replacement projects, highway safety projects, public transit projects, railroad projects, and bicycle projects. For information on the TIP process or specific questions about a TIP project, contact the TIP Development Unit of the NCDOT.

Public Access Funds

If an industry, school or volunteer fire department wishes to develop property that does not have access to a state maintained highway and certain conditions are met, then funds may be made available for construction of an access road. For more information on public access funds, please contact the appropriate Division Engineer.

Small Urban Funds

Small Urban funds are annual discretionary funds made to municipalities with qualifying projects. The maximum amount is $150,000 per year per project. A town may have multiple projects. Requests for Small Urban Fund assistance should be directed to the appropriate Board of Transportation member and Division Engineer.

The North Carolina Highway Trust Fund Law

The Highway Trust Fund Law was established in 1989 as a plan with four major goals for North Carolina's roads and highways. These goals are:

1. To complete the remaining 2,768 km (1,716 mi.) of four lane construction on the 5,800 km (3,600 mi.) North Carolina Inrastate System.

2. To construct a multilane connector in Asheville and portions of multilane loops in Charlotte, Durham, Greensboro, Raleigh, Wilmington, and Winston-Salem.

3. To supplement the secondary roads appropriation in order to pave, by 1999, 16,100 km (10,000 mi.) of unpaved secondary roads carrying 50 or more vehicles per day, and all other unpaved secondary roads by 2006.

4. To supplement the Powell Bill Program.

For more information on the Highway Trust Fund Law, contact the Program Development Branch of the North Carolina Department of Transportation.

Figures

Figures

LEGEND

	EXISTING	PROPOSED
MAJOR	▬▬▬▬	▬ ▬ ▬ ▬
MINOR	▬▬▬▬	▬ ▬ ▬ ▬

ADPOTED BY:

CITY OF SOUTHPORT — JULY 13, 2000

PUBLIC HEARING — JULY 13, 2000

RECOMMENDED BY STATEWIDE PLANNING — SEPTEMBER 11, 2000

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION — OCTOBER 13, 2000

FIGURE 1

JULY 13, 2000

THOROUGHFARE PLAN FOR SOUTHPORT

Brunswick County
NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH

IN COOPERATION WITH THE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

0 1500 3000 4500 6000 7500 9000
scale in feet

Base Map Date
April 12, 2000

Figures

LEGEND

	EXISTING	PROPOSED
MAJOR	———	- - - -
MINOR	———	- - - -

ADPOTED BY:

CITY OF SOUTHPORT — JULY 13, 2000

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SOUTHPORT

Brunswick County
NORTH CAROLINA

PREPARED BY THE
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FEDERAL HIGHWAY ADMINISTRATION

0 1500 3000 4500 6000 7500 9000
scale in feet

Base Map Date
April 12, 2000

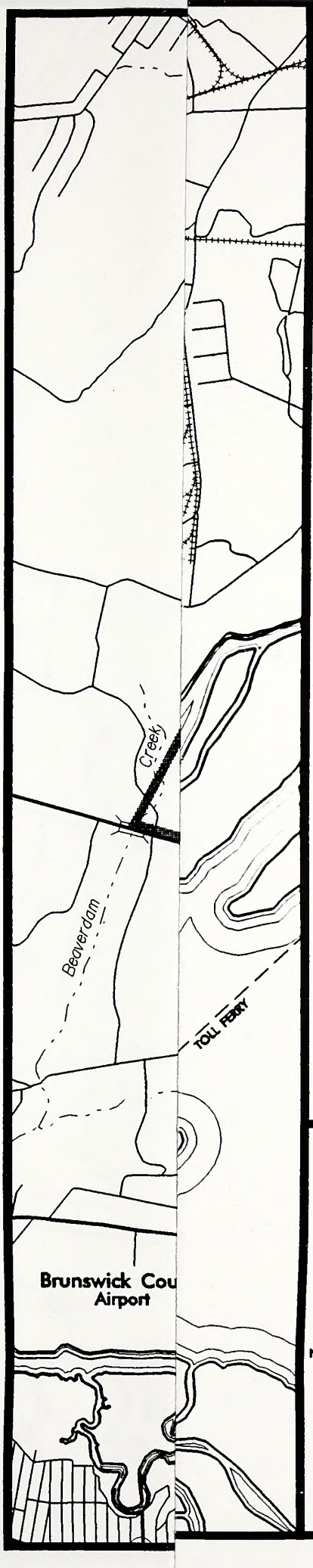

FIGURE 2

PLANNING AREA BOUNDARY

SOUTHPORT

Brunswick County
NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH

IN COOPERATION WITH THE

U.S.DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

0 1500 3000 4500 6000 7500 9000
scale in feet

Base Map Date
April 12, 2000

FIGURE 2

PLANNING AREA BOUNDARY

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0 1500 3000 4500 6000 7500 9000
scale in feet

Base Map Date
April 12, 2000

N

S

LEGEND

00000 1997 Avg. Annual Daily Traffic Count

00000 2025 Avg. Annual Daily Traffic Count

FIGURE 3

AVERAGE DAILY TRAFFIC COUNTS

SOUTHPORT

Brunswick County
NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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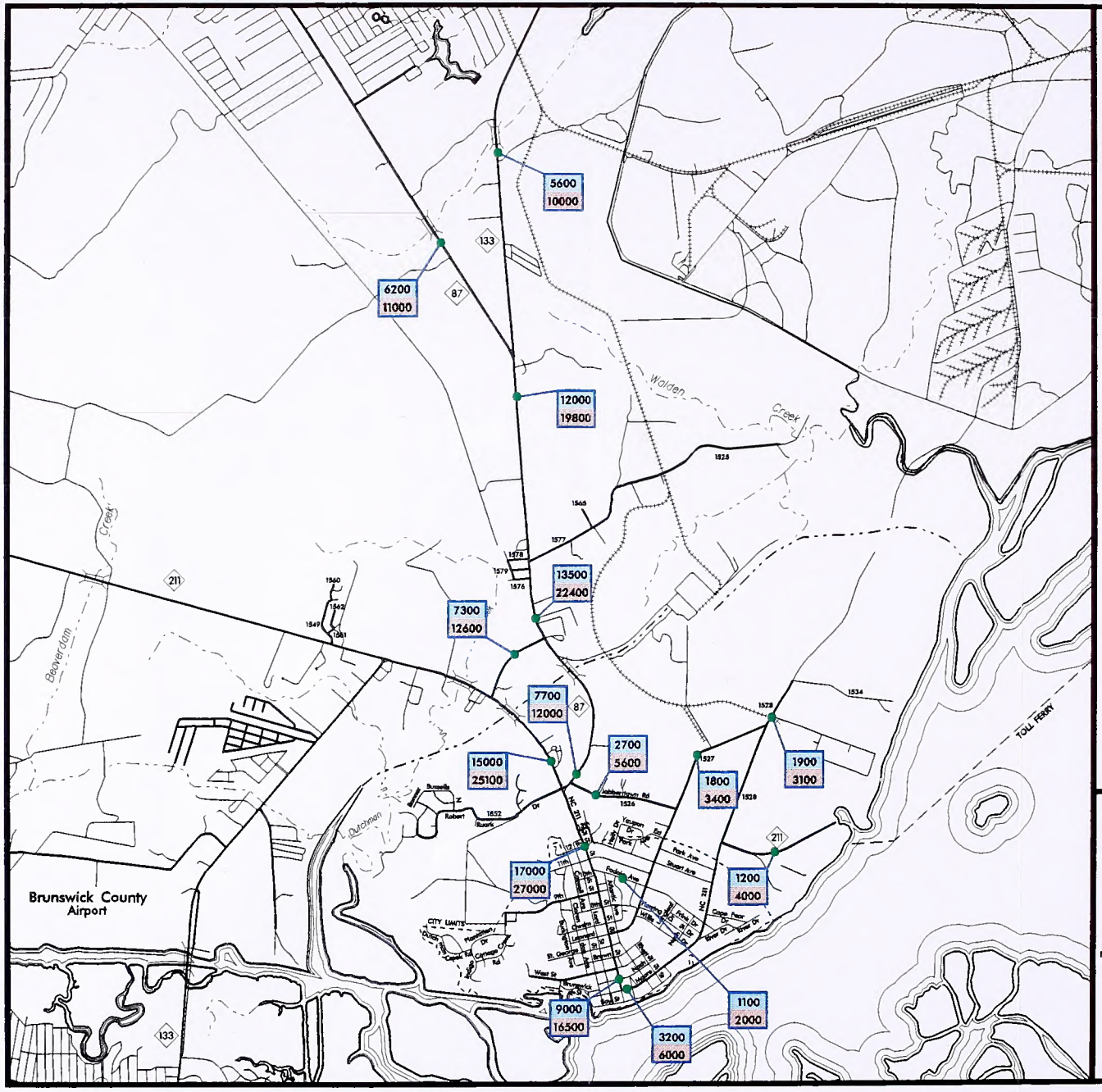
0 1500 3000 4500 6000 7500 9000

scale in feet

Base Map Date
April 12, 2000



LEGEND

00000 1997 Avg. Annual Daily Traffic Count
00000 2025 Avg. Annual Daily Traffic Count

FIGURE 3

AVERAGE DAILY TRAFFIC COUNTS

SOUTHPORT

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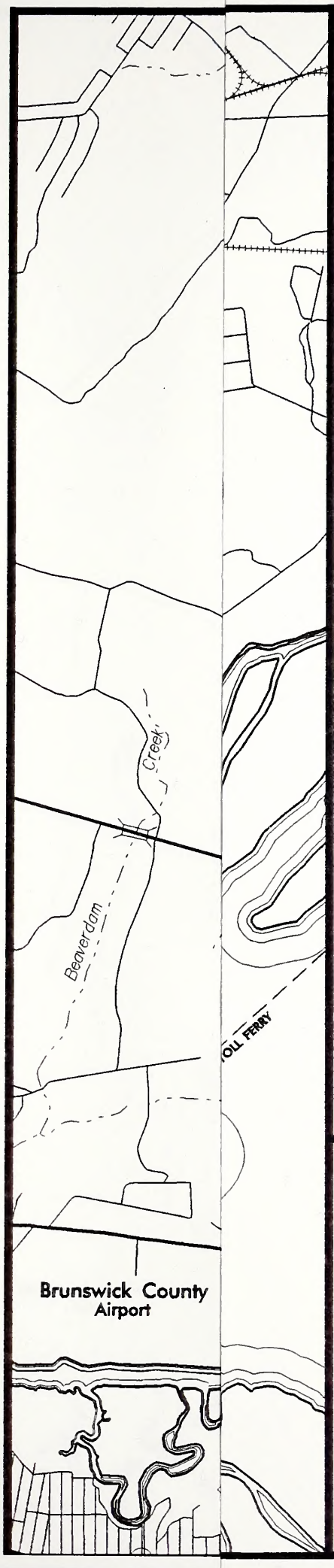

N

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LEGEND

Near Capacity

Over Capacity

FIGURE 4

2000 CAPACITY DEFICIENCIES

SOUTHPORT

Brunswick County

NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATEWIDE PLANNING BRANCH

IN COOPERATION WITH THE

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

0 1500 3000 4500 6000 7500 9000

scale in feet

Base Map Date

April 12, 2000

LEGEND

- Near Capacity
- Over Capacity

FIGURE 4

2000 CAPACITY DEFICIENCIES

SOUTHPORT

Brunswick County
NORTH CAROLINA

PREPARED BY THE
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0 1500 3000 4500 6000 7500 9000
scale in feet

Base Map Date
April 12, 2000

N
S

LEGEND

Near Capacity

Over Capacity

FIGURE 5

2025 CAPACITY DEFICIENCIES

SOUTHPORT

Brunswick County
NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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0 1500 3000 4500 6000 7500 9000
scale in feet

Base Map Date
April 12, 2000

LEGEND

- Near Capacity
- Over Capacity

FIGURE 5

2025 CAPACITY DEFICIENCIES

SOUTHPORT

Brunswick County
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0 1500 3000 4500 6000 7500 9000
scale in feet

Base Map Date
April 12, 2000

N

S

LEGEND

	WIDENING	NEW LOCATION
TIP PROJECT R-3324		
4 LANE DIVIDED		
5 LANE		
4 LANE		
2 LANE		

FIGURE 6

2025 RECOMMENDED IMPROVEMENTS

SOUTHPORT

Brunswick County
NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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Base Map Date
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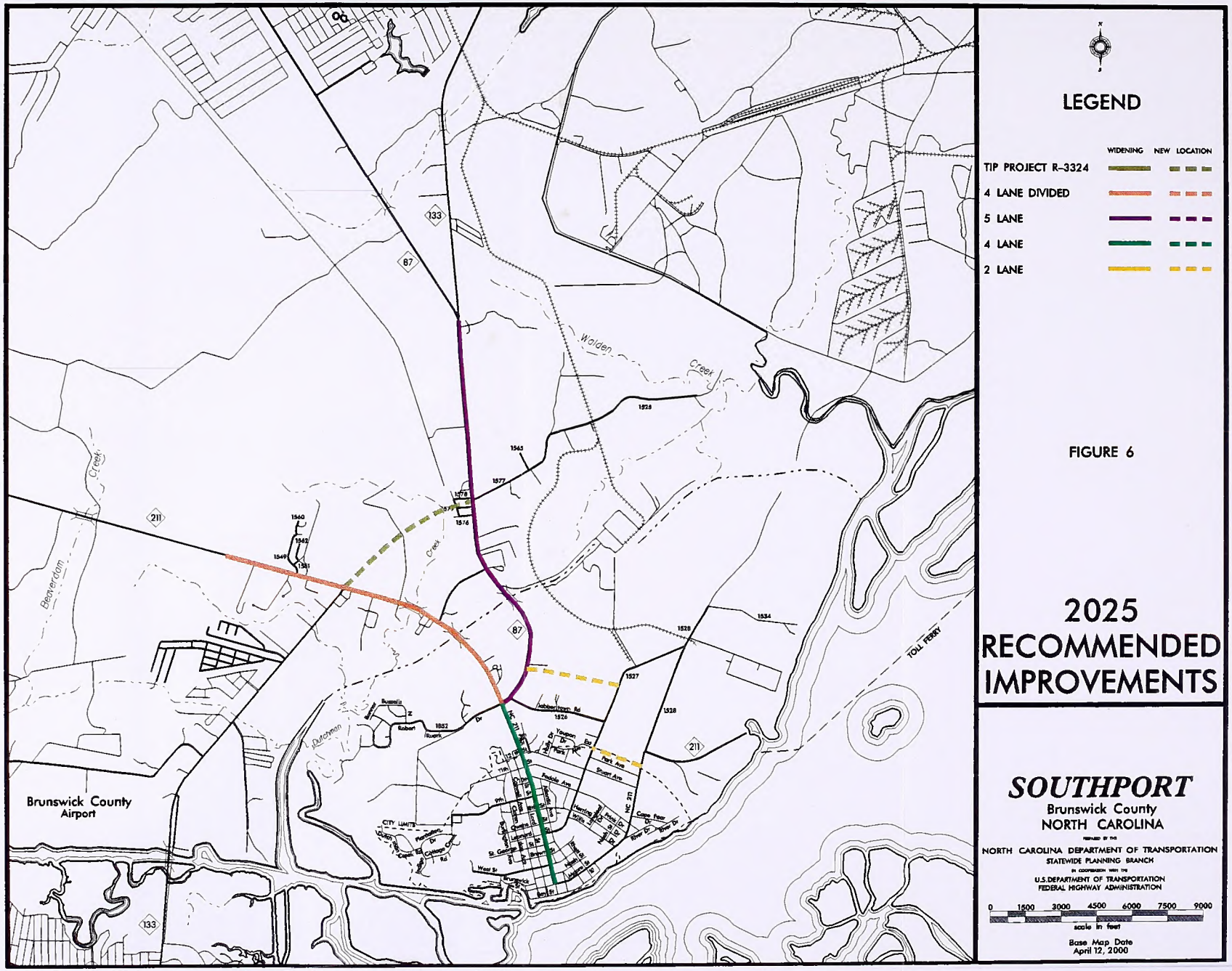
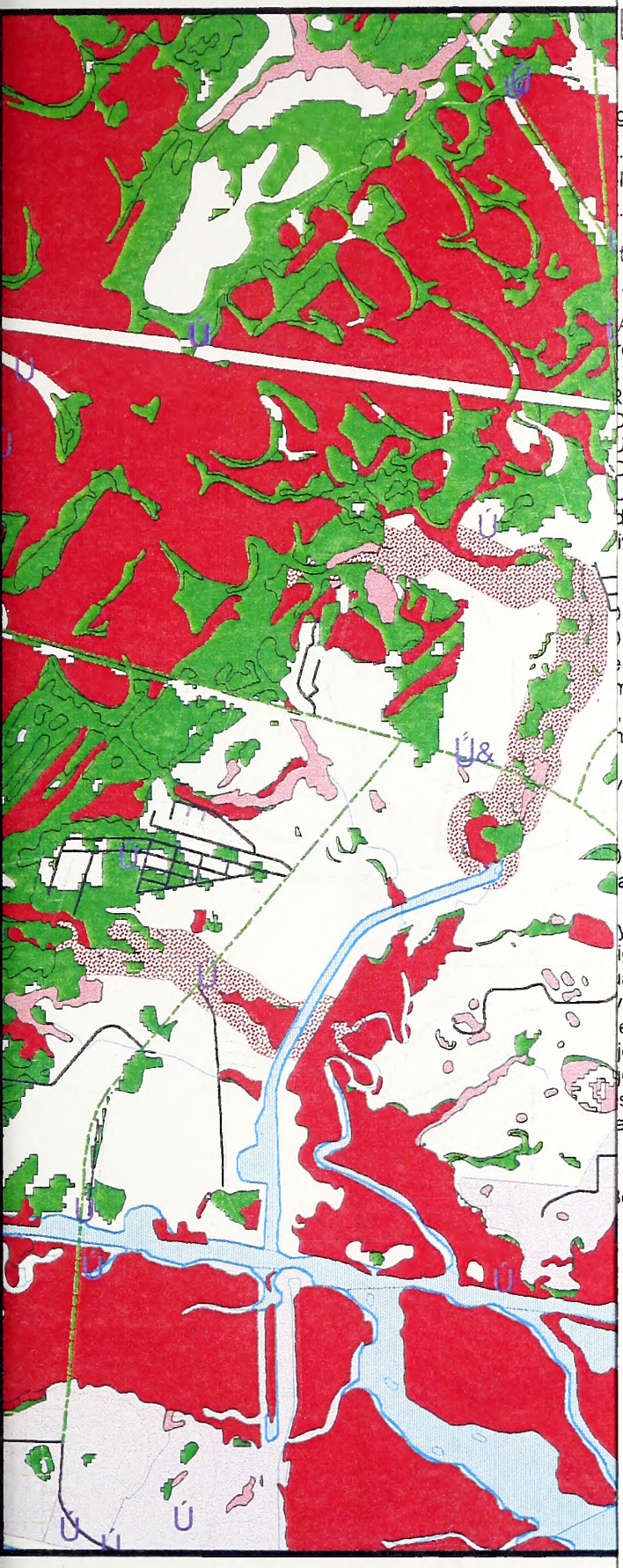

LEGEND
WIDENING
NEW LOCATION
TIP PROJECT R-3324
4 LANE DIVIDED
5 LANE
4 LANE
2 LANE
FIGURE 6
2025
RECOMMENDED
IMPROVEMENTS
SOUTHPORT
Brunswick County
NORTH CAROLINA
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
0 1500 3000 4500 6000 7500 9000
scale in feet
Base Map Date
April 12, 2000
Brunswick County
Airport
Walden Creek
Beaverdam Creek
Dutchman Creek
TOLL FERRY
CITY LIMITS
133
87
211
NC 211



port Environmental Factors

LEGEND

ge Occurence Sites (Restricted-100k)

-NR (Restricted-100k)

NR (Restricted-100k)

-SL(Restricted-100k)

te Facilities (24k)

Waste Facilities (Unverified 24k)

Areas (Haz. Subs. Dispos. Sites)

rc-24k)

- no attributes)

Route

Divided

Undivided

Divided

Undivided

ded

ivided

eets

n Rd

Ramp

nents

Parkway

vice Rd

k TIGER w/ attributes)

al Habitat Areas (1 mile buffer-24k)

y Wetlands

igh)

uality Wetlands

Wetlands

ers/Streams (100k)

jor Rivers/Streams (100k)

or Water Bodies (100k)

s (100k)

atersheds (24k)

oundaries (24k)

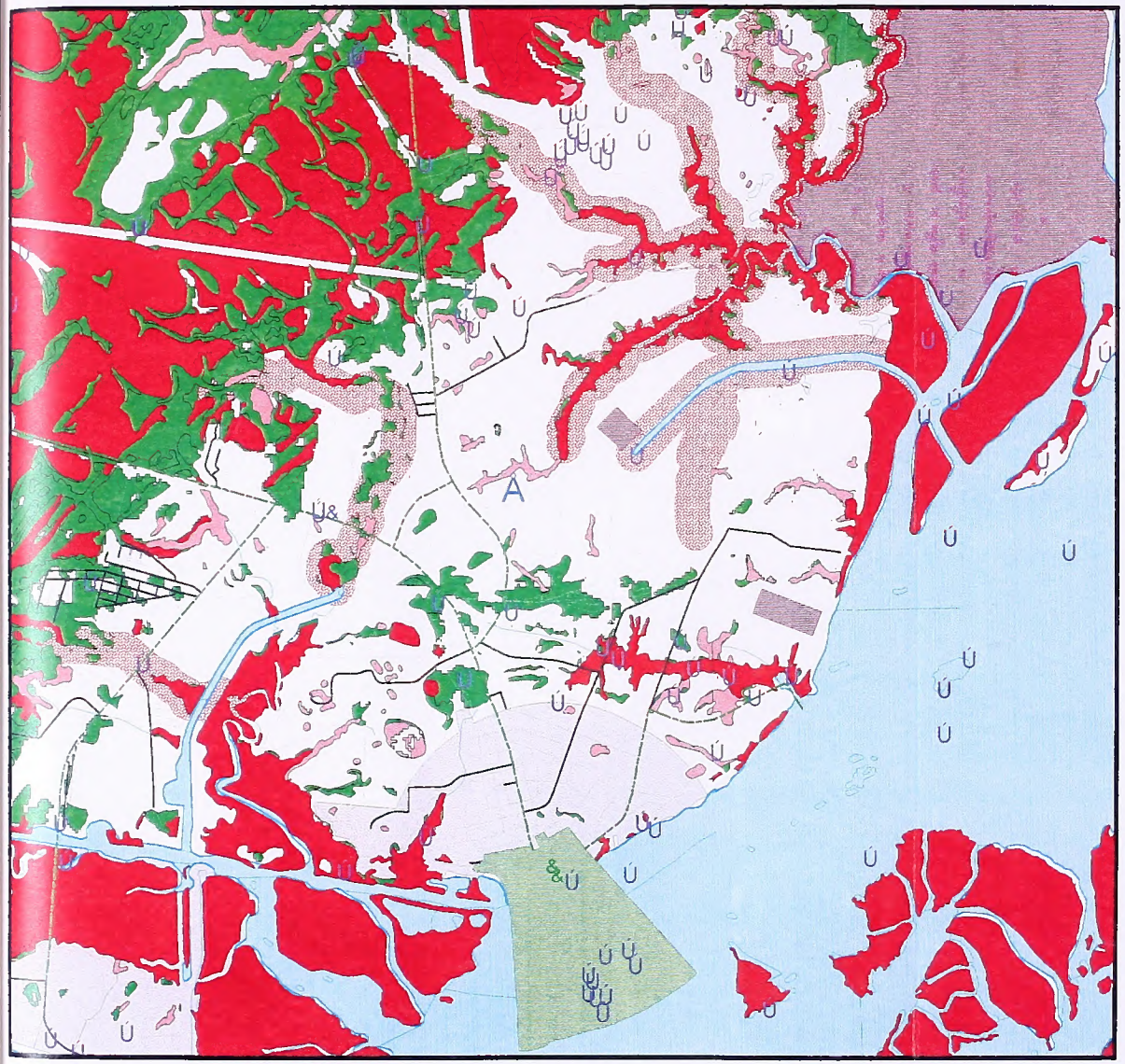
N

W E

S

0.4 0

Figure 7 - Southport Environmental Factors



0.4 0 0.4 0.8 1.2 1.6 Miles

LEGEND

- Nat. Heritage Occurence Sites (Restricted-100k)
- Hist. Struct.-NR (Restricted-100k)
- Hist. Dist. -NR (Restricted-100k)
- Hist. Struct.-SL(Restricted-100k)
- Solid Waste Facilities (24k)
- Hazardous Waste Facilities (Unverified 24k)
- Superfund Areas (Haz. Subs. Dispos. Sites)
- Marinas (arc-24k)

Roads (DOT 24k - no attributes)

- Interstate Route
- US Route Divided
- US Route Undivided
- NC Route Divided
- NC Route Undivided
- SR 4L Divided
- SR 4L Undivided
- SR 2L T-51
- SR 2L T-41
- SR 2L T-20
- SR 2L T-10
- Urban Streets
- Non-System Rd
- Service Rd, Ramp
- Misc. Segments
- Blue Ridge Parkway
- Forest Service Rd
- Trail
- Unknown
- Roads (100k TIGER w/ attributes)
- Prop. Critical Habitat Areas (1 mile buffer-24k)

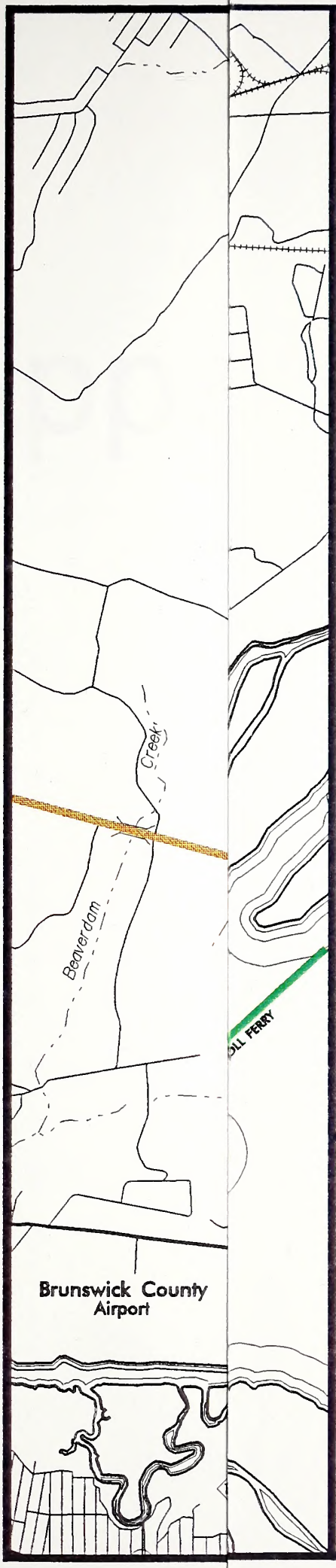
DCM Wetlands

- High Quality Wetlands
- Pocosin (High)
- Medium Quality Wetlands
- Low Quality Wetlands
- Hydro - Rivers/Streams (100k)
- Hydro - Major Rivers/Streams (100k)
- Hydro - Major Water Bodies (100k)
- HQW Zones (100k)

Water Supply Watersheds (24k)

- Critical
- Protected
- Municipal Boundaries (24k)

N W E S



N

S

LEGEND

CITY OF SOUTHPORT BIKE ROUTE

NC BIKE ROUTE #3

NC BIKE ROUTE #3 & 6

CITY OF SOUTHPORT BIKE ROUTE & NC BIKE ROUTE #3

FIGURE 8

BICYCLE ROUTES

SOUTHPORT

Brunswick County
NORTH CAROLINA

PREPARED BY THE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATEWIDE PLANNING BRANCH

IN COOPERATION WITH THE

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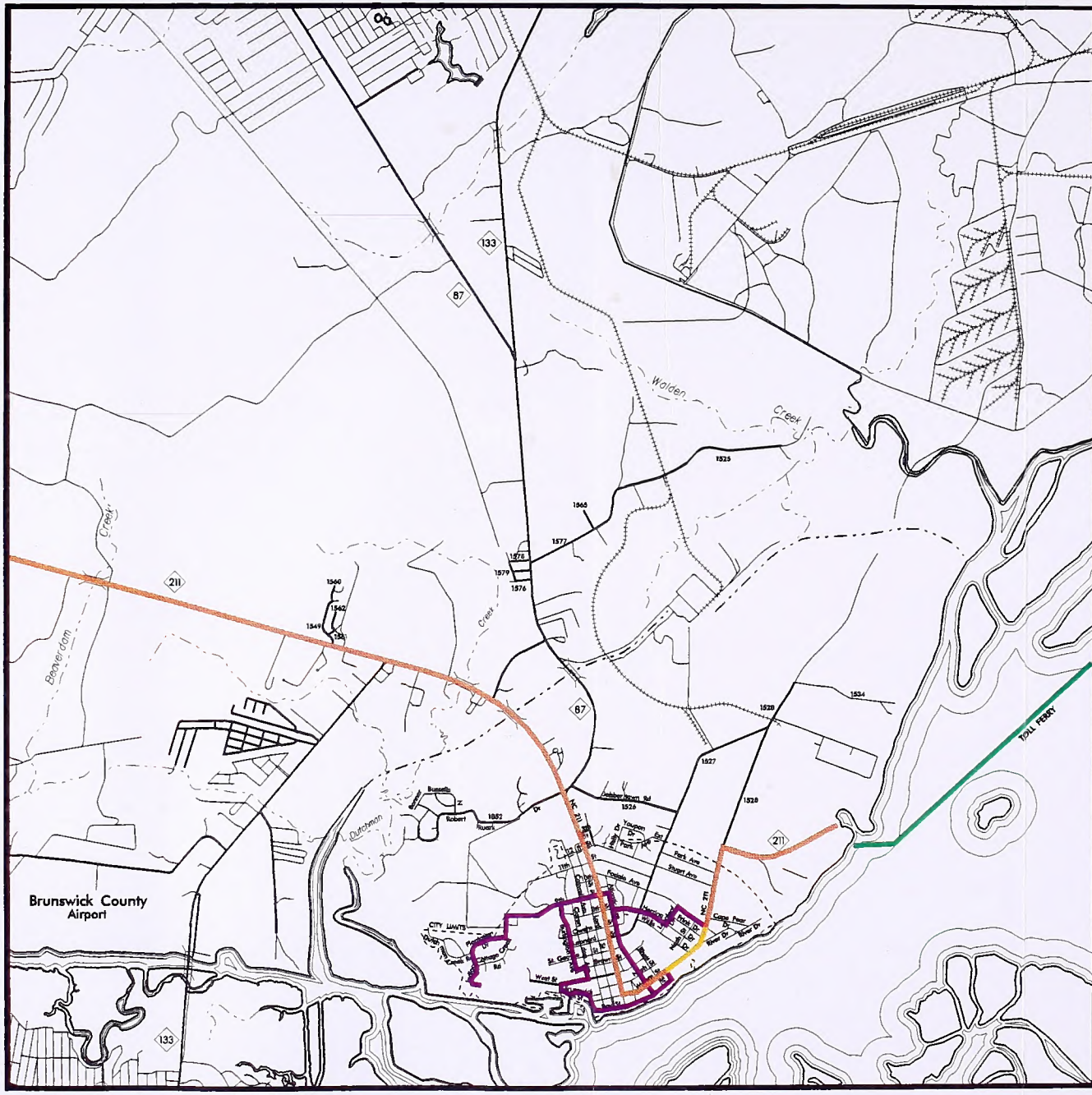
0 1500 3000 4500 6000 7500 9000

scale in feet

Base Map Date
April 12, 2000



LEGEND

CITY OF SOUTHPORT BIKE ROUTE

NC BIKE ROUTE #3

NC BIKE ROUTE #3 & 6

CITY OF SOUTHPORT BIKE ROUTE & NC BIKE ROUTE #3

FIGURE 8

BICYCLE ROUTES

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0 1500 3000 4500 6000 7500 9000
scale in feet

Base Map Date
April 12, 2000

Appendix

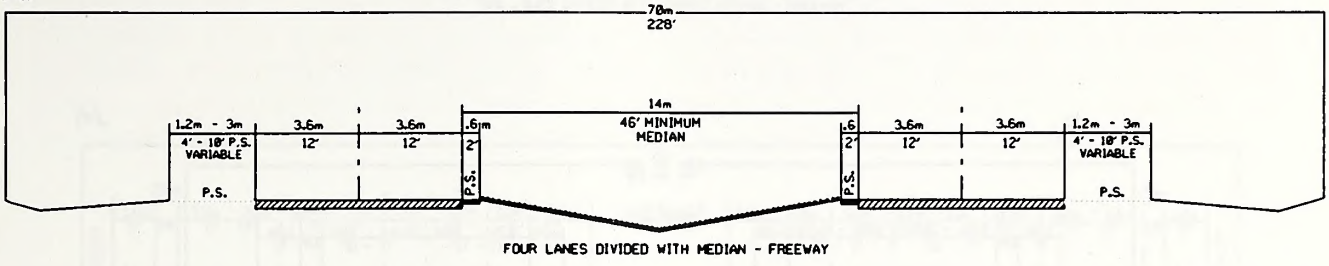
Appendix A1
Southport Transportation Plan Street Tabulation

Facility and Section		Existing Road Section (1997)						Future Road Section (2025)		2025 Recommended Cross Section	
		Distance	Roadway		ROW	Capacity	ADT	Capacity	ADT		
from	to	mi	lanes	width(ft)	(ft)	(vpd)	(vpd)	(vpd)	(vpd)	Cross Section	ROW (ft)
NC 211											
NC Ferry Terminal	Southport City Limit	0.84	2	22	60	11100	1200	11100	4000	ADQ	ADQ
Southport City Limit	Kinsley Street	0.85	2	22	100	11100	1200-3200	11100	4000-6000	ADQ	ADQ
Kinsley Street	Rhett Street	0.08	2	64	100	12500	3200	11100	6000	ADQ	ADQ
Rhett Street	Howe Street Int.	0.22	2	70	100	12500	3200	11100	6000	ADQ	ADQ
Howe Street Int.	Nash Street	0.08	2	70	unknown	12500	9000	28000	16500	G	70
Nash Street	West Street	0.1	2	61	unknown	12500	9000	28000	16500	G	70
West Street	Southport City Limit	0.88	2	52	90	12500	9000-17000	28000	16500-27000	G	70
Southport City Limit	NC 87	0.39	2	20	60	12500	17000	35000	27000	F	94-110
NC 87	Planning Area Bnd.	0.83	2	22	150	12500	15600	35000	25100	F	94-110
NC 87											
NC 211 Intersection	Dosher Cut Off Rd.	1.28	2	24	100	12000	7700	12000	12000	ADQ	ADQ
Dosher Cut Off Rd.	NC 87/NC 133 Split	1.94	2	24	100	12000-15000	13500	32500	22400	N	90
NC 87/NC 133 Split	Planning Area Bnd.	1.43	2	24	150	12000	6200	12000	11000	ADQ	ADQ
NC 133											
NC 211	NC 87	0.59	2	22	60	12000	7300	12000	12600	*	ADQ
NC 87	NC 87/NC 133 Split	1.97	2	24	100	12000-15000	13500	32500	22400	N	90
NC 87/NC 133 Split	Planning Area Bnd.	1.06	2	24	100	12000	5600	12000	10000	ADQ	ADQ
Leonard Street (SR1527)											
River Rd. Intersection	Southport City Limit	1.2	2	22	unknown	11100	1800	11100	3400	ADQ	ADQ
Southport City Limit	Howe Street Int.	0.85	2	18	unknown	11100	1100	11100	3200	ADQ	ADQ
Jabbertown Road (SR1526)											
NC 87	Leonard Street	0.8	2	22	unknown	11100	2700	11100	5600	ADQ	ADQ
West Street (SR1194)											
Moore Street	End Maintenance	0.65	2	18	60	10200	2600	10200	5400	ADQ	ADQ

* TIP Project 3324 would decrease traffic on this roadway and therefore the existing cross section would be adequate

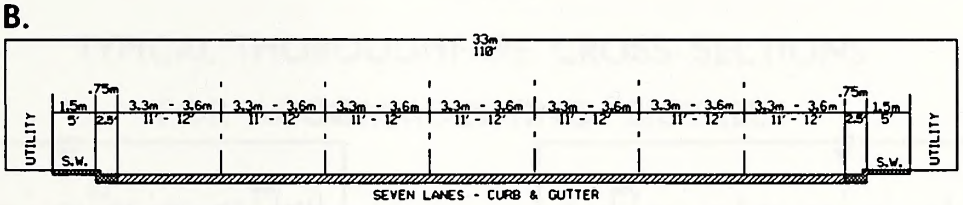
TYPICAL THOROUGHFARE CROSS SECTIONS

A.



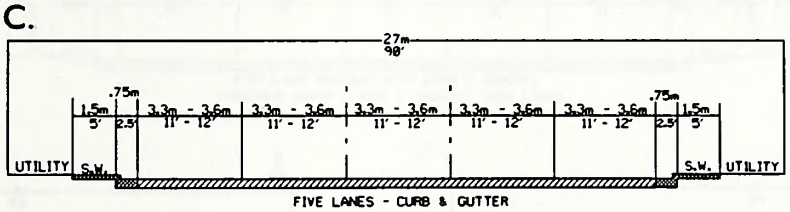
FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



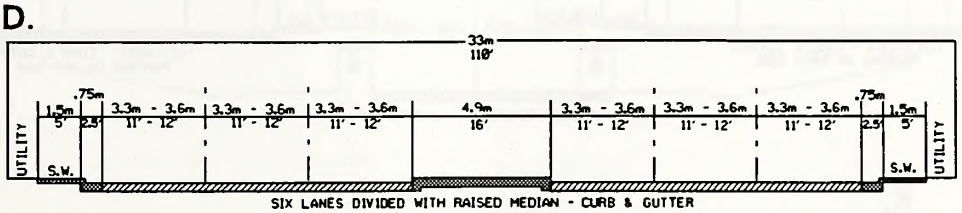
SEVEN LANES - CURB & GUTTER

C.



FIVE LANES - CURB & GUTTER

D.

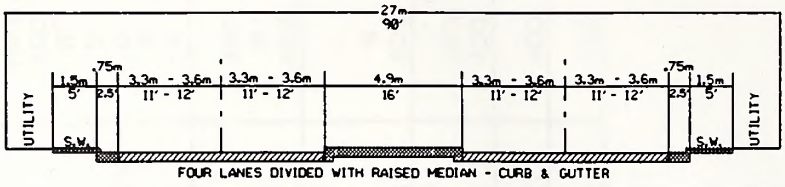


SIX LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

APPENDIX A

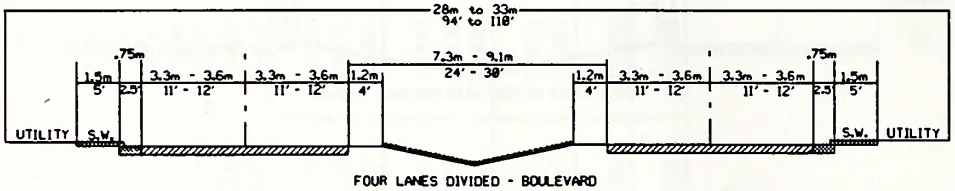
TYPICAL THOROUGHFARE CROSS SECTIONS

E.



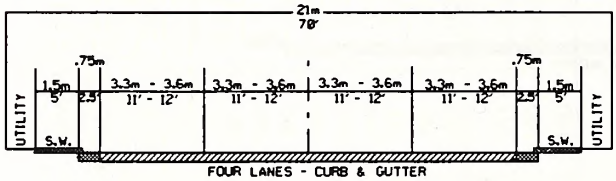
FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

F.



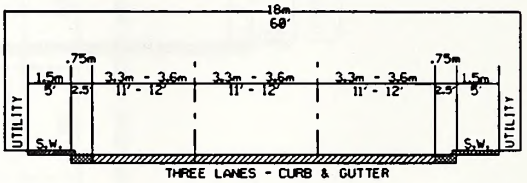
FOUR LANES DIVIDED - BOULEVARD
GRASS MEDIAN

G.



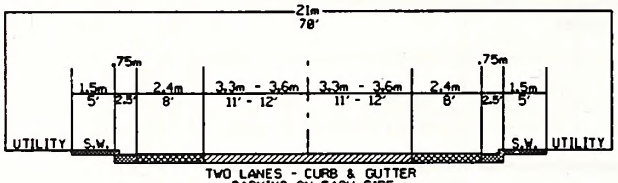
FOUR LANES - CURB & GUTTER

H.



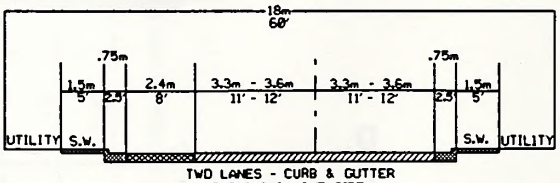
THREE LANES - CURB & GUTTER

I.



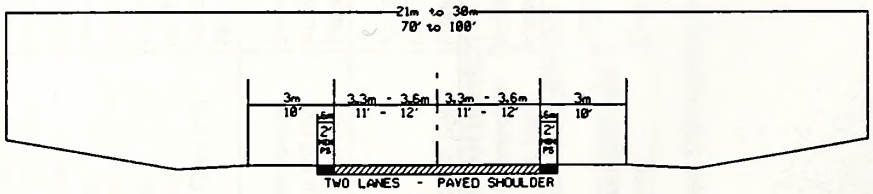
TWO LANES - CURB & GUTTER
PARKING ON EACH SIDE

J.



TWO LANES - CURB & GUTTER
PARKING ON ONE SIDE

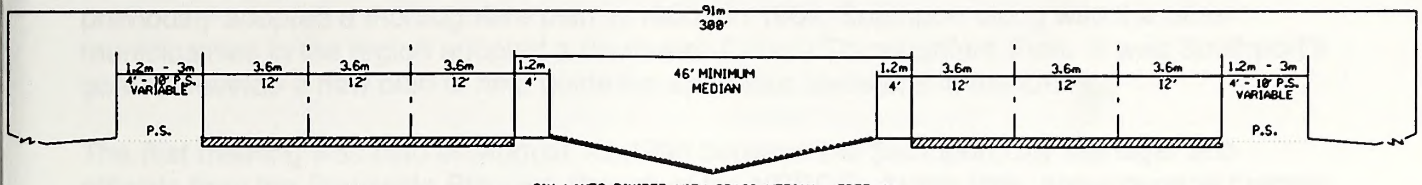
K.



TWO LANES - PAVED SHOULDER

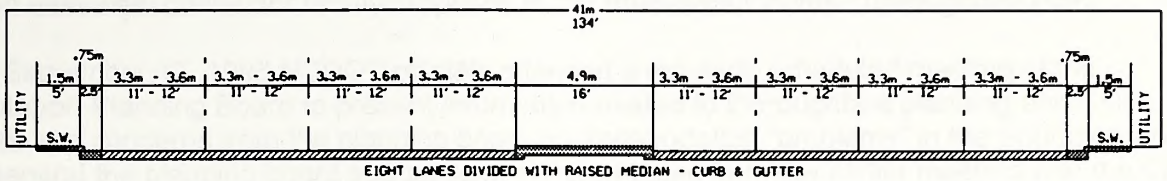
TYPICAL THOROUGHFARE CROSS SECTIONS

L.



SIX LANES DIVIDED WITH GRASS MEDIAN - FREEWAY

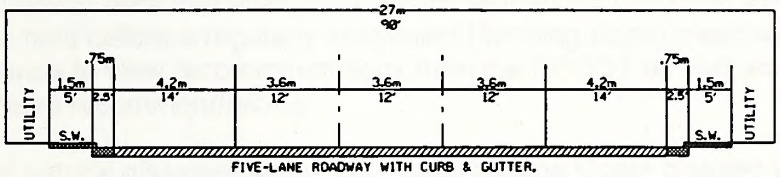
M.



EIGHT LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

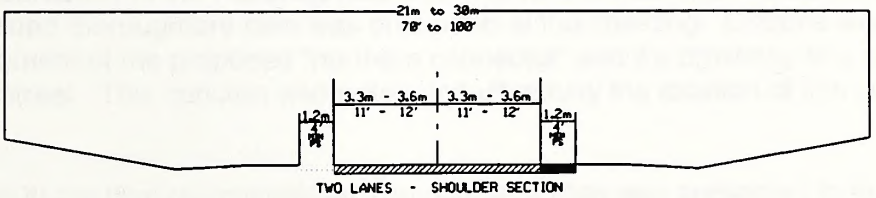
TYPICAL THOROUGHFARE CROSS SECTIONS FOR ACCOMMODATING BICYCLES

N.



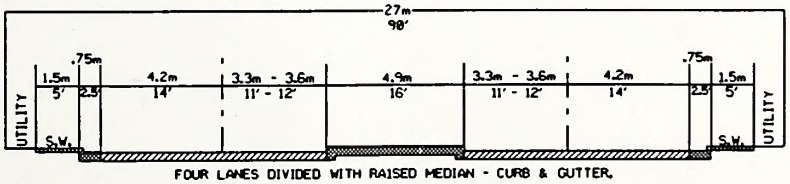
FIVE-LANE ROADWAY WITH CURB & GUTTER,
STANDARD INSIDE LANES & WIDENED CURB LANES

O.



TWO LANES - SHOULDER SECTION

P.



FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER,
STANDARD INSIDE LANES & WIDENED CURB LANES

A2. Public Involvement

In 1998, the Statewide Planning Branch of the North Carolina Department of Transportation received a request from the City of Southport to update their Thoroughfare Plan. Southport had previously adopted a thoroughfare plan in 1960. In 1984, Southport along with the other municipalities in the region adopted a Brunswick County Thoroughfare Plan. It was Southport's goal to develop a new plan to help guide transportation decisions in the future.

The first meeting was held on August 18, 1998 between the Southport City Manager and officials from the Statewide Planning Branch of the NCDOT. At this time, some general themes and problem areas concerning transportation were discussed. Some noted problem areas were the intersections of Howe Street and 12th Street, NC 87 and NC 211, and Howe Street and West Street; traffic on NC 211 through town; traffic on the Dosher Cut-off Road and some question as to an east-west connector facility proposed in the Brunswick County Thoroughfare Plan.

On September 17, 1998 NCDOT officials attended a regularly scheduled meeting of the Southport Planning Board to present information related to thoroughfare planning and solicit ideas and concerns from the planning board on transportation "problems" in the Southport area. In general the planning board suggestions mirrored those from the earlier meeting with the City Manager. One added area of concern or emphasis point was the possible addition of a "northern connector" that would link the NC Ferry Terminal to NC 87 or NC 211 without utilizing NC 211 through the downtown area.

On January 21, 1999 a subsequent meeting was held with the Southport Planning Board to give an update on the work being done as well as solicit input on the best way to help involve the citizens of Southport in the planning process beyond their participation in Planning Board meetings. It was decided here that after initial recommendations had been formulated, a public workshop would be held before a regularly scheduled Planning Board meeting which would allow citizens a chance to view recommendations from the NCDOT as well as comment in a non formal setting on these recommendations.

Due to a number of natural disasters along the North Carolina Coast coupled with a hectic schedule among NCDOT employees, the next meeting in Southport didn't occur until April 20, 2000. This meeting consisted of a public workshop to present recommendations and hear concerns/comments from the public and a public hearing at the Planning Board Meeting for the purpose of presentation to the Planning Board as well as a formal opportunity for citizen input. The recommended thoroughfare plan was presented at this meeting. Citizens were concerned about the placement of the proposed "northern connector" and it's proximity to a neighborhood near Leonard Street. This concern was noted and ultimately the location of this connector was changed.

On June 15, 2000 the final recommended Thoroughfare Plan was presented to the Planning Board and they voted unanimously to recommend this plan to the Southport Board of Alderman.

Finally, on July 13, 2000 the Southport Board of Alderman voted to approve the Southport Thoroughfare Plan.

A3. Level of Service Definitions

The various levels of service are defined below for uninterrupted flow facilities, but the basic concepts apply to all roads.

LOS A

Represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.

LOS B

Is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behavior.

LOS C

Is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably in this range.

LOS D

Represents high-density, but stable flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.

LOS E

Represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is high. Operations at this level are usually unstable because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.

LOS F

Is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount that can traverse the point. Queues form behind such locations. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. Vehicles may progress at reasonable speeds for several hundred feet or more then be required to stop in a cyclic fashion. LOS F is used to describe the operating conditions within the queue, as well as the point of breakdown.

A4. Purpose and Need Statements

Northern Connector/Yaupon Drive

Project Recommendation: It is recommended that two new 2-lane facilities be constructed, one on existing City owned right-of-way (Yaupon Drive) and one on new location (Northern Connector). These facilities will connect the southeastern side of Southport and very specifically the NC Ferry Terminal and existing Industrial Development to NC 87 and provide an alternative to alleviate growing traffic congestion in the downtown area of Southport.

Transportation Demand: This facility has been proposed in response to growing concern over traffic through downtown Southport. This traffic includes passengers from the NC Ferry Terminal as well as continued heavy truck traffic from industrial plants located in the area. Future growth in this area is expected to consist of mostly residential development with some chance of industrial growth. The NC Ferry Terminal is also expected to continue passenger growth into the future. Anticipated growth in the area also includes the relocation of the Bald Head Island Ferry operation near the NC Ferry Terminal which is expected to immediately impact traffic and cause concerns for the future as well.

Capacity: The capacity of the proposed facility will be approximately 14,000 vehicles per day, which will handle the anticipated traffic demand at Level of Service C or better. The existing major alternative, NC 211 will not be able to handle the increasing traffic demand even if widened to 4 lanes. In addition, excessive traffic would continue to use Jabbertown Road, a residential street, not suitable for high traffic volumes or the types of vehicles associated with the industrial development in the area.

System Linkage: The Northern Connector along with Yaupon Drive will provide access to the increasing number of residences and existing and proposed industrial and ferry operations in the southeastern section of Southport. Existing NC 211, while designed to handle fairly large amounts of traffic will not be able to handle the expected growth even with widening to four lanes. The Northern Connector along with Yaupon Drive is also expected to serve as a major link in the case of declared evacuation from the Southport area.

The location of the Northern Connector, while not completely direct, does avoid existing wetlands in the area while still providing a vital connection to NC 87 via an alternative route other than NC 211. If placed in other seemingly "better" locations in the area, the impact on the environment and wetlands would be severe.

NC 211

Project Recommendation: It is recommended that this existing roadway be widened from it's existing 2-lane cross section to a 4-lane divided facility to accommodate steadily increasing traffic volumes. This facility serves traffic between Southport and Oak Island.

Transportation Demand: The widening of this facility is being proposed in response to growing traffic volumes between Southport and Oak Island as well as the continued commercial development occurring along this corridor. In the last year, A Wal-Mart as well as a Hampton Inn have opened on this stretch of road. This development is a direct response of the growth of the area as well as the attractiveness of the Southport/Oak Island area as a tourist destination. This growth is expected to continue and possibly intensify in the future.

Capacity: The capacity of the proposed facility will be approximately 35,000 vehicles per day, which will handle the anticipated traffic demand at Level of Service C or better. As this is the only connection between Southport and Oak Island, NC 87 and NC 211 and the possibility of any other direct connection is impossible due to environmental concerns, the existing facility would become significantly over capacity by the year 2025 if this widening is not done.

System Linkage: The widening of this facility will provide traffic capacity necessary to handle expected growth in the Southport/Oak Island area and continue to provide the transportation link between Southport and Oak Island. NC 211 also serves as a direct connection to points west, including the town of Supply and a vital link to US 17.

NC 87/NC 133

Project Recommendation: It is recommended that this existing 2 and 3-lane facility be widened to a 5-lane divided cross section. This facility is the only connection from north/northeast (I-40, Wilmington area) to the Southport/Oak Island area.

Transportation Demand: The widening of this facility is being proposed in response to growing traffic from the Wilmington/I-40 area to the Southport/Oak Island area. This traffic consists of tourists as well as commuter traffic. This traffic is only expected to increase in the future as Southport/Oak Island become even more popular as tourist destinations as well as "bedroom" communities for Wilmington.

Capacity: The capacity of the proposed facility will be approximately 32,500 vehicles per day, which will handle the anticipated traffic demand at Level of Service C or better. There are no other alternatives to this route as a connection between the Wilmington area and the Southport/Oak Island area.

System Linkage: See Capacity above.

Howe Street

Project Recommendation: It is recommended that this existing 2-lane facility be widened to a 4-lane cross section. This road serves as the main artery through downtown Southport, and connects NC 211 and the general area to the NC Ferry Terminal.

Transportation Demand: The widening of this facility is being proposed in response to existing residential and commercial development that exists on both sides of the roadway throughout the section, and traffic volumes that have grown substantially and are projected to grow into the future. As development in the area increases, traffic is expected to increase as well. Also, as the Southport area continues to grow as a tourist destination, traffic can also be expected to grow.

Capacity: The capacity of the proposed facility will be approximately 28,000 vehicles per day, which will handle the anticipated traffic demand at Level of Service C or better. The proposed Northern Connector/Yaupon Drive project will help to alleviate some traffic from NC 211. However, even the addition of these facilities will not keep from increasing traffic demands on NC 211. Without the addition of extra lanes, AND the construction of the Northern Connector/Yaupon Drive project, Howe Street would become significantly over-capacity by the year 2025.

System Linkage: The widening of Howe Street will provide the needed capacity to help the downtown Southport area relieve congestion. NC 211 serves as the connection between US 17 and Wilmington via the NC Ferry. This connection is a vital link in North Carolina's transportation system. Without the widening of Howe Street, this link will be congested to the point of frustration and uselessness.

A5. Environmental Analysis

One of the main goals in transportation planning is to plan facilities that safely serve the public while having the least affect on environmental and historical concerns in the area. The Southport area (and the entire Coastal Plain really) is inundated with wetlands. Therefore the issue of avoidance is almost impossible but it is still a goal to be maintained. Figure 7 shows the current environmental analysis of the Southport area. If one looks closely at this map, two things jump out. The first is that the proposed location of the "northern connector" is very close to a national heritage site as well as high and low quality wetlands. The actual location of this facility would of course be determined with the help of more specific locations of the roadway itself as well as the environmental concerns in the area, however, it has been placed in such a way as to avoid both the national heritage site as well as the wetlands.

Secondly, downtown Southport is considered a Historic area. The issue of avoidance here is just as important as before. This magnifies the importance of the "northern connector" by alleviating traffic through the historic downtown area.

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